INFORMATION TECHNOLOGY NETWORKING STANDARDS

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All Nevadans ready for success in the 21st century

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To improve student achievement and educator effectiveness by ensuring opportunities, facilitating learning, and promoting excellence

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The development of Nevada career and technical standards and assessments is a collaborative effort sponsored by the Office of Career Readiness, Adult Learning & Education Options at the Department of Education and the Career and Technical Education Consortium of States. The Department of Education relies on teachers and industry representatives who have the technical expertise and teaching experience to develop standards and performance indicators that truly measure student skill attainment. Most important, however, is recognition of the time, expertise and great diligence provided by the writing team members in developing the career and technical standards for IT Networking.

STANDARDS DEVELOPMENT MEMBERS

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BUSINESS AND INDUSTRY VALIDATION

All CTE standards developed through the Nevada Department of Education are validated by business and industry through one or more of the following processes: (1) the standards are developed by a team consisting of business and industry representatives; or (2) a separate review panel was coordinated with industry experts to ensure the standards include the proper content; or (3) the adoption of nationally-recognized standards endorsed by business and industry.

The IT Networking standards were validated with the adoption of the nationally recognized standards approved by Cisco.

PROJECT COORDINATOR

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INTRODUCTION

The standards in this document are designed to clearly state what the student should know and be able to do upon completion of an advanced high school IT Networking program. These standards are designed for a three-credit course sequence that prepares the student for a technical assessment directly aligned to the standards.

These exit-level standards are designed for the student to complete all standards through their completion of a program of study. These standards are intended to guide curriculum objectives for a program of study.

The standards are organized as follows:

Content Standards are general statements that identify major areas of knowledge, understanding, and the skills students are expected to learn in key subject and career areas by the end of the program.

Performance Standards follow each content standard. Performance standards identify the more specific components of each content standard and define the expected abilities of students within each content standard.

Performance Indicators are very specific criteria statements for determining whether a student meets the performance standard. Performance indicators may also be used as learning outcomes, which teachers can identify as they plan their program learning objectives.

The crosswalk and alignment section of the document shows where the performance indicators support the Nevada Academic Content Standards in Science (based on the Next Generation Science Standards) and in English Language Arts and Mathematics (based on the Common Core State Standards). Where correlation with an academic content standard exists, students in the IT Networking program perform learning activities that support, either directly or indirectly, achievement of the academic content standards that are listed.

All students are encouraged to participate in the career and technical student organization (CTSO) that relates to the IT Networking program. CTSOs are co-curricular national associations that directly enforce learning in the CTE classroom through curriculum resources, competitive events, and leadership development. CTSOs provide students the ability to apply academic and technical knowledge, develop communication and teamwork skills, and cultivate leadership skills to ensure college and career readiness.

The Employability Skills for Career Readiness identify the “soft skills” needed to be successful in all careers, and must be taught as an integrated component of all CTE course sequences. These standards are available in a separate document.

The **Standards Reference Code** is only used to identify or align performance indicators listed in the standards to daily lesson plans, curriculum documents, or national standards.

Program Name: IT Networking Standards Reference Code: **ITN**

Example: ITN.2.3.4

Standards	Content Standard	Performance Standard	Performance Indicator
IT Networking	2	3	4

CONTENT STANDARD 1.0 : UTILIZE SAFETY PROCEDURES AND PROPER TOOLS

PERFORMANCE STANDARD 1.1 : UTILIZE SAFETY PROCEDURES

1.1.1 Define industry standard vocabulary
1.1.2 Explain the purpose of safe working conditions and safe lab procedures
1.1.3 Interpret Material Safety Data Sheets (MSDS)
1.1.4 Demonstrate the proper use of safety devices
1.1.5 Research the environmental impact of production, use, and disposal of technology materials
1.1.6 Research local, state, and federal regulations related to material handling
1.1.7 Demonstrate proper disposal of technology materials
1.1.8 Explain the relationship between organization and safety
1.1.9 Demonstrate an organized work environment

PERFORMANCE STANDARD 1.2 : UTILIZE PROPER TOOLS

1.2.1 Identify industry standard tools for computer service, repair, and maintenance
1.2.2 Demonstrate the proper use, care, and storage of hand tools, test equipment, and diagnostic tools
1.2.3 Utilize appropriate documentation methods and procedures
1.2.4 Utilize appropriate inventory practices

CONTENT STANDARD 2.0 : EXAMINE NETWORK SYSTEM HARDWARE

PERFORMANCE STANDARD 2.1 : IDENTIFY COMPUTER AND NETWORK HARDWARE

2.1.1 Define industry standard vocabulary
2.1.2 Analyze and describe networking interfaces
2.1.3 Identify internetworking equipment
2.1.4 Identify various networking topologies
2.1.5 Differentiate between various network transmission media
2.1.6 Demonstrate proper cabling techniques
2.1.7 Discuss signal degradation
2.1.8 Describe the use of each of the classifications of hardware components
2.1.9 Categorize the various types of power supplies
2.1.10 Differentiate between the form factors of motherboards
2.1.11 Describe various levels and types of memory and storage devices
2.1.12 Classify various expansion adaptors
2.1.13 Differentiate between various CPU types and cooling types
2.1.14 Compare and configure network devices

PERFORMANCE STANDARD 2.2 : EXPLORE ROUTERS AND SWITCHES

2.2.1 Describe industry standard ports
2.2.2 Compare media access control techniques and logical topologies used in networks
2.2.3 Build a simple network using the appropriate media
2.2.4 Analyze and describe industry standard router interfaces
2.2.5 Research the purpose of routers
2.2.6 Compare and contrast computers and routers
2.2.7 Relate routers and the network layers
2.2.8 Configure a router with basic configurations
2.2.9 Explain the operation of Ethernet
2.2.10 Explain how a switch operates
2.2.11 Demonstrate how network layer protocols and services support communication across data networks
2.2.12 Demonstrate how routers enable end-to-end connectivity in a small to medium-sized business
2.2.13 Demonstrate how devices route traffic in a small to medium-sized business network

PERFORMANCE STANDARD 2.3 : INVESTIGATE WIRELESS NETWORKS
2.3.1 Describe various wireless network standards
2.3.2 Compare and contrast authentication and encryption
2.3.3 Explain the properties of secure wireless networks
2.3.4 Identify wireless devices
2.3.5 Differentiate between industry standard wireless technologies
2.3.6 Diagram various wireless network topologies
2.3.7 Construct a network utilizing wireless Layer 2 devices
PERFORMANCE STANDARD 2.4 : TROUBLESHOOT HARDWARE
2.4.1 Describe common symptoms for a given discrepancy
2.4.2 Explain key terms and acronyms used in diagnostic testing and troubleshooting
2.4.3 Develop a solution for a given discrepancy
2.4.4 Document the solution

CONTENT STANDARD 3.0 : UNDERSTAND COMPUTER SERVICE

PERFORMANCE STANDARD 3.1 : PRACTICE INSTALLATION OF HARDWARE AND NETWORK SYSTEMS

- 3.1.1 Select components appropriate to customer needs
- 3.1.2 Install key components
- 3.1.3 Select appropriate operating system features and tools based on customer needs

PERFORMANCE STANDARD 3.2 : CONFIGURE, INSTALL, AND MAINTAIN PERIPHERALS

- 3.2.1 Install and configure interfaces for peripherals
- 3.2.2 Configure peripherals
- 3.2.3 Explain differences among various types of printers
- 3.2.4 Compare various types of display devices
- 3.2.5 Compare various types of audio devices
- 3.2.6 Perform regular maintenance on peripherals
- 3.2.7 Maintain proper documentation

PERFORMANCE STANDARD 3.3 : COMMUNICATE EFFECTIVELY WITH CUSTOMERS

- 3.3.1 Analyze customer needs by asking relevant questions
- 3.3.2 Address customer's concerns without using jargon, slang, or acronyms
- 3.3.3 Maintain customer service log
- 3.3.4 Demonstrate appropriate netiquette
- 3.3.5 Discuss the role of ethics in IT services

PERFORMANCE STANDARD 3.4 : OPERATING SYSTEMS

- 3.4.1 Compare and contrast Windows Operating Systems, Linux systems, and iOS
- 3.4.2 Explain various features of operating systems
- 3.4.3 Install and secure operating systems
- 3.4.4 Compare mobile operating systems
- 3.4.5 Explain basic features of a mobile operating system

CONTENT STANDARD 4.0 : ANALYZE SYSTEM NETWORK PROTOCOLS

PERFORMANCE STANDARD 4.1 : UNDERSTAND NETWORK PROTOCOLS

- 4.1.1 Describe the characteristics of each layer of the Open Systems Interconnection (OSI) model
- 4.1.2 Identify and explain functions and uses of routing protocols
- 4.1.3 Explain the role of the data link layer in supporting communication across the data networks
- 4.1.4 Explain how the address resolution protocol enables communication on a network
- 4.1.5 Explain how transport layer protocols and services support communications across data networks
- 4.1.6 Compare the operations of transport layer protocols in supporting end-to-end communication
- 4.1.7 Explain the operation of the application layer in providing support to end-user applications
- 4.1.8 Compare the TCP/IP model to the OSI model
- 4.1.9 Identify and formulate binary, decimal, and hexadecimal numbers
- 4.1.10 Explain the use of IPv4 and IPv6 addresses to provide connectivity in small to medium-sized business networks

PERFORMANCE STANDARD 4.2 : IMPLEMENT NETWORK PROTOCOLS

- 4.2.1 Demonstrate the configuration of various network protocols
- 4.2.2 Given a set of requirements, implement a VLSM addressing scheme to provide connectivity to end users in a business network
- 4.2.3 Use common testing utilities to verify and test network connectivity
- 4.2.4 Implement an IPv4 and IPv6 addressing scheme to enable end-to-end connectivity in a business network
- 4.2.5 Explain design considerations for implementing IPv4 and IPv6 in a business network

CONTENT STANDARD 5.0 : UNDERSTAND SECURITY OF PHYSICAL LAYERS, SOFTWARE, AND NETWORK ACCESS	
PERFORMANCE STANDARD 5.1 : PROTECTING NETWORKS	
5.1.1	Identify common security threats
5.1.2	Analyze types of current cyber threats
5.1.3	Describe methods to prevent breeches in security, e.g., pass phrase, OS patch management, disabling unused accounts
5.1.4	Describe physical security vs. digital security
5.1.5	Explain current security trends in mobile applications
5.1.6	Explain key terms related to security
5.1.7	Identify the prevention of and protections against cyber threats
PERFORMANCE STANDARD 5.2 : CONFIGURATION	
5.2.1	Implement best practices to secure a workstation
5.2.2	Secure a SOHO wireless/wired network
5.2.3	Document a plan of disaster recovery
5.2.4	Implement security best practices with customer's sensitive information and data
5.2.5	Use common show commands and utilities to establish a relative baseline for the network
PERFORMANCE STANDARD 5.3 : EVENT HANDLING	
5.3.1	Research the need for network security
5.3.2	Evaluate threats to network security
5.3.3	Describe the purpose of firewall operations
5.3.4	Explain proper password implementation
5.3.5	Describe user and group accounts
5.3.6	Investigate user and group security policies
5.3.7	Explain the differences between the various iOS and OS security settings
5.3.8	Create incident reports according to policies and procedures
5.3.9	Explain the difference between data stored, data in transit, and data being processed
5.3.10	Discuss how data can be compromised, corrupted, or lost
5.3.11	Define virtualization technology

PERFORMANCE STANDARD 5.4 : UNDERSTAND ETHICS IN RELATION TO CYBERSECURITY
5.4.1 Distinguish among types of ethical concerns
5.4.2 Identify actions that constitute cyber bullying
5.4.3 Identify laws applicable to cybersecurity
5.4.4 Explain the concept of “personally identifiable information”
5.4.5 Analyze the social and legal significance of the ongoing collection of personal digital information

CONTENT STANDARD 6.0 : CONSTRUCT NETWORK SYSTEMS

PERFORMANCE STANDARD 6.1 : IDENTIFY NETWORK SYSTEM NEEDS

- 6.1.1 Identify and describe the benefits of the hierarchical network model
- 6.1.2 Define the acronyms for telecommunications
- 6.1.3 Perform a customer network needs assessment
- 6.1.4 Analyze the network needs assessment for solutions
- 6.1.5 Evaluate the physical and logical topology considerations
- 6.1.6 Evaluate network media usage and connectivity functions

PERFORMANCE STANDARD 6.2 : DESIGN AND EVALUATE NETWORK SYSTEMS

- 6.2.1 Create unshielded twisted pair (UTP) cables, e.g., straight, rollover, crossover
- 6.2.2 Choose and implement the appropriate network solution (peer-to-peer vs. client-server)
- 6.2.3 Design and evaluate performance of various types of networks
- 6.2.4 Diagram the network infrastructure (i.e., physical and logical topology)
- 6.2.5 Explain factors that enhance a network's throughput
- 6.2.6 Critique final network designs

PERFORMANCE STANDARD 6.3 : CONSTRUCT NETWORK SYSTEMS

- 6.3.1 Construct Local Area Networks (LAN) utilizing network designs
- 6.3.2 Construct Wide Area Networks (WAN) using multiple Local Area Networks (LAN)
- 6.3.3 Configure wireless devices (i.e., wireless access points, bridges, etc.)
- 6.3.4 Describe internet connection types and features
- 6.3.5 Compare and contrast Mesh, Ring, Bus, Star, Hybrid
- 6.3.6 Compare and contrast network types, e.g., LAN, WAN, PAN, MAN

PERFORMANCE STANDARD 6.4 : PERFORM NETWORK ADMINISTRATION AND MONITORING

- 6.4.1 Create documentation of a network baseline
- 6.4.2 Diagram and update changes to the physical and logical topologies
- 6.4.3 Describe common issues that occur during network administration and monitoring
- 6.4.4 Utilize diagnostic tools to validate the interconnectivity of network designs (i.e., Ping, Tracert, Netstat, Nslookup, etc.)
- 6.4.5 Utilize iOS diagnostic tools to validate the interconnectivity of network designs (i.e., show interfaces, show MAC address tables, etc.)

CONTENT STANDARD 7.0 : MAINTAIN NETWORK SYSTEMS

PERFORMANCE STANDARD 7.1 : DEMONSTRATE NETWORK TROUBLESHOOTING AND DIAGNOSTICS

- 7.1.1 Explain troubleshooting theory
- 7.1.2 Describe the stages of network documentation processes
- 7.1.3 Explain key terms and acronyms used in diagnostic testing and troubleshooting
- 7.1.4 Describe the layered models and how they are used for troubleshooting
- 7.1.5 Investigate and diagnose network failures
- 7.1.6 Demonstrate password implementation and recovery
- 7.1.7 Utilize diagnostic tools
- 7.1.8 Troubleshoot a network

PERFORMANCE STANDARD 7.2 : DEMONSTRATE NETWORK MAINTENANCE

- 7.2.1 Install and configure firewall services
- 7.2.2 Install and update anti-virus software
- 7.2.3 Develop a routine maintenance plan
- 7.2.4 Document network diagrams for various types of networks
- 7.2.5 Revise network design for scalability and maintainability

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CROSSWALKS AND ALIGNMENTS

CROSSWALKS (ACADEMIC STANDARDS)

The crosswalk of the IT Networking Standards shows links to the Nevada Academic Content Standards in Science (based on the Next Generation Science Standards – Disciplinary Core Ideas Arrangement) and in English Language Arts and Mathematics (based on the Common Core State Standards). The crosswalk identifies the performance indicators in which the learning objectives in the IT Networking program support academic learning. The performance indicators are grouped according to their content standard and are crosswalked to the Nevada Academic Content Standards in Science, English Language Arts, and Mathematics.

ALIGNMENTS (MATHEMATICAL PRACTICES)

In addition to correlation with the Nevada Academic Content Standards for Mathematics, many performance indicators support the Mathematical Practices. The following table illustrates the alignment of the IT Networking Standards Performance Indicators and the Mathematical Practices. This alignment identifies the performance indicators in which the learning objectives in the IT Networking program support academic learning.

ALIGNMENTS (SCIENCE AND ENGINEERING PRACTICES)

In addition to correlation with the Nevada Academic Content Standards for Science, many performance indicators support the Science and Engineering Practices. The following table illustrates the alignment of the IT Networking Standards Performance Indicators and the Science and Engineering Practices. This alignment identifies the performance indicators in which the learning objectives in the IT Networking program support academic learning.

CROSSWALKS (COMMON CAREER TECHNICAL CORE)

The crosswalk of the [IT Networking] Standards shows links to the Common Career Technical Core. The crosswalk identifies the performance indicators in which the learning objectives in the IT Networking program support the Common Career Technical Core. The Common Career Technical Core defines what students should know and be able to do after completing instruction in a program of study. The IT Networking Standards are crosswalked to the Information Technology Career Cluster™ and the Network Systems Career Pathway.

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CROSSWALK OF IT NETWORKING STANDARDS AND THE NEVADA ACADEMIC CONTENT STANDARDS

CONTENT STANDARD 1.0: UTILIZE SAFETY PROCEDURES AND PROPER TOOLS

Performance Indicators	Nevada Academic Content Standards
1.1.2	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** RST.11-12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics. RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible. **English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
1.1.5	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** RST.11-12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics. **English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** WHST.11-12.9 Draw evidence from informational texts to support analysis, reflection, and research.
1.2.3	**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

CONTENT STANDARD 2.0: EXAMINE NETWORK SYSTEM HARDWARE

Performance Indicators	Nevada Academic Content Standards
2.1.2	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** RST.11-12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics. **English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
2.1.7	**English Language Arts: Speaking and Listening Standards** SL.11-12.2 Integrate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to make informed decisions and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data. SL.11-12.4 Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks.
2.3.5	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** RST.11-12.6 Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, identifying important issues that remain unresolved. **English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
2.3.6	**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
2.4.4	**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

CONTENT STANDARD 3.0: UNDERSTAND COMPUTER SERVICE

Performance Indicators	Nevada Academic Content Standards
3.3.1	**English Language Arts: Speaking and Listening Standards** SL.11-12.1c Propel conversations by posing and responding to questions that probe reasoning and evidence; ensure a hearing for a full range of positions on a topic or issue; clarify, verify, or challenge ideas and conclusions; and promote divergent and creative perspectives.
3.3.2	**English Language Arts: Speaking and Listening Standards** SL.11-12.4 Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks.
3.3.5	**English Language Arts: Speaking and Listening Standards** SL.11-12.1 Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11–12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively. SL.11-12.1d Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the task.
3.4.2	**English Language Arts: Speaking and Listening Standards** SL.11-12.4 Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks. **English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** WHST.11-12.9 Draw evidence from informational texts to support analysis, reflection, and research.
3.4.5	**English Language Arts: Speaking and Listening Standards** SL.11-12.4 Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks. **English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** WHST.11-12.9 Draw evidence from informational texts to support analysis, reflection, and research.

CONTENT STANDARD 4.0: ANALYZE SYSTEM NETWORK PROTOCOLS

Performance Indicators	Nevada Academic Content Standards
4.1.1	**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** WHST.11-12.9 Draw evidence from informational texts to support analysis, reflection, and research.
4.1.2	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** RST.11-12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics. **English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
4.1.3	**English Language Arts: Speaking and Listening Standards** SL.11-12.4 Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks.
4.1.4	**English Language Arts: Speaking and Listening Standards** SL.11-12.4 Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks.
4.1.5	**English Language Arts: Speaking and Listening Standards** SL.11-12.4 Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks.
4.1.7	**English Language Arts: Speaking and Listening Standards** SL.11-12.4 Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks.
4.2.5	**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** WHST.11-12.9 Draw evidence from informational texts to support analysis, reflection, and research.

CONTENT STANDARD 5.0: UNDERSTAND SECURITY OF PHYSICAL LAYERS, SOFTWARE, AND NETWORK ACCESS

Performance Indicators	Nevada Academic Content Standards
5.1.2	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** RST.11-12.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.
5.1.7	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** RST.11-12.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.
5.2.2	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** RST.11-12.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.
5.2.3	**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** WHST.11-12.2d Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.
5.3.3	**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** WHST.11-12.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. WHST.11-12.2d Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.
5.3.5	**English Language Arts: Speaking and Listening Standards** SL.11-12.4 Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks.
5.3.7	**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** WHST.11-12.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.
5.3.8	**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** WHST.11-12.2d Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.
5.3.10	**English Language Arts: Speaking and Listening Standards** SL.11-12.4 Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks.

CONTENT STANDARD 6.0: CONSTRUCT NETWORK SYSTEMS

Performance Indicators	Nevada Academic Content Standards
6.1.1	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible. **English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
6.1.2	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** RST.11-12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics. **English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
6.1.3	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** RST.11-12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics. **English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
6.1.4	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.
6.1.5	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.
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Performance Indicators	Nevada Academic Content Standards
6.2.5	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** RST.11-12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics. **English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
6.2.6	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** RST.11-12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics. **English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
6.4.1	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** RST.11-12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics. **English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
6.4.2	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** RST.11-12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics. **English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
6.4.3	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** RST.11-12.5 Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas. **English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
6.4.4	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** RST.11-12.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.
6.4.5	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** RST.11-12.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.

CONTENT STANDARD 7.0: MAINTAIN NETWORK SYSTEMS

Performance Indicators	Nevada Academic Content Standards
7.1.2	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** RST.11-12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics. RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible. **English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
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7.2.1	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** RST.11-12.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.
7.2.2	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** RST.11-12.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.
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7.2.4	**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

ALIGNMENT OF IT NETWORKING STANDARDS AND THE MATHEMATICAL PRACTICES

Mathematical Practices	IT Networking Performance Indicators
1. Make sense of problems and persevere in solving them.	2.4.4 3.2.6; 3.3.1 7.1.8; 7.2.5
2. Reason abstractly and quantitatively.	2.3.7
3. Construct viable arguments and critique the reasoning of others.	5.1.2 6.1.3; 6.2.6
4. Model with mathematics.	
5. Use appropriate tools strategically.	1.1.6; 1.2.2, 1.2.3 3.1.3
6. Attend to precision.	1.2.4 2.1.15; 2.2.3, 2.2.8 3.1.2; 3.2.1, 3.2.2; 3.4.3
7. Look for and make use of structure.	4.2.4 5.1.2; 5.3.2
8. Look for and express regularity in repeated reasoning.	

ALIGNMENT OF IT NETWORKING STANDARDS AND THE SCIENCE AND ENGINEERING PRACTICES

Science and Engineering Practices	IT Networking Performance Indicators
1. Asking questions (for science) and defining problems (for engineering).	3.1.3; 3.3.1 5.2.3
2. Developing and using models.	
3. Planning and carrying out investigations.	6.1.3, 6.1.5, 6.1.6; 6.4.5 7.1.5, 7.1.7, 7.1.8
4. Analyzing and interpreting data.	
5. Using mathematics and computational thinking.	4.1.9
6. Constructing explanations (for science) and designing solutions (for engineering).	2.1.15; 2.2.3 3.2.2 4.2.1 6.2.3, 6.2.4
7. Engaging in argument from evidence.	
8. Obtaining, evaluating, and communicating information.	6.4.1 7.2.4

CROSSWALKS OF IT NETWORKING STANDARDS AND THE COMMON CAREER TECHNICAL CORE

Information Technology Career Cluster™ (IT)	Performance Indicators
1. Demonstrate effective professional communication skills and practices that enable positive customer relationships.	1.1.1; 3.3.1 - 3.3.5
2. Use product or service design processes and guidelines to produce a quality information technology (IT) product or service.	2.1.15; 2.2.3, 2.2.7, 2.2.8 2.2.11 - 2.2.13 3.4.1 - 3.4.5
3. Demonstrate the use of cross-functional teams in achieving IT project goals.	
4. Demonstrate positive cyber citizenry by applying industry accepted ethical practices and behaviors.	3.3.5; 5.4.1 - 5.4.4
5. Explain the implications of IT on business development.	
6. Describe trends in emerging and evolving computer technologies and their influence on IT practices.	
7. Perform standard computer backup and restore procedures to protect IT information.	7.1.1 - 7.1.8; 7.2.1-7.2.5
8. Recognize and analyze potential IT security threats to develop and maintain security requirements.	5.1.1 - 5.1.7; 5.2.1 - 5.2.5 5.3.1 - 5.3.11
9. Describe quality assurance practices and methods employed in producing and providing quality IT products and services.	2.4.1 - 2.4.4; 4.1.2
10. Describe the use of computer forensics to prevent and solve information technology crimes and security breaches.	5.3.1 - 5.3.11
11. Demonstrate knowledge of the hardware components associated with information systems.	1.2.1; 3.1.1 - 3.1.3 3.2.1 - 3.2.7; 3.4.1 - 3.4.5
12. Compare key functions and applications of software and determine maintenance strategies for computer systems.	3.1.1; 3.2.1, 3.2.2

Network Systems Career Pathway (IT-NET)	Performance Indicators
1. Analyze customer or organizational network system needs and requirements.	6.1.3 - 6.1.6; 6.3.1 - 6.3.6
2. Analyze wired and wireless network systems to determine if they meet specifications (e.g., IEEE, power, security).	2.3.1 - 2.3.7; 6.3.5
3. Design a network system using technologies, tools and standards.	2.1.1 - 2.1.15 2.2.1 - 2.1.13; 4.2.5 5.2.1 - 5.2.5; 6.2.1 - 6.2.6
4. Perform network system installation and configuration.	4.1.1 - 4.1.10 4.2.1 - 4.2.5;
5. Perform network administration, monitoring and support to maintain a network system.	6.4.1 - 6.4.5; 7.1.1 - 7.1.8 7.2.1 - 7.2.5